World Journal of Biology Pharmacy and Health Sciences
eISSN: 2582-5542
Cross Ref DOI: 10.30574/wjbphs
Journal homepage: https://wjbphs.com/

(REVIEW ARTICLE)

Telemedicine and outcome in patient care: Review

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World Journal of Biology Pharmacy and Health Sciences, 2024, 19(03), 086–091

Publication history: Received on 24 July 2024; revised on 29 August 2024; accepted on 31 August 2024

Article DOI: https://doi.org/10.30574/wjbphs.2024.19.3.0588

Abstract

Telemedicine is a term given to the use of electronic and telecommunication methods in patient's healthcare. Presently it is being used for diagnostic, treatment and research purposes.

Since the recent pandemic telemedicine has become more transformative and has enhanced patient's access to different medical settings across the globe, this review will evaluate the role of telemedicine in improving patient outcomes.

The management of chronic diseases in areas of the world where specialty medical services are not easily accessible has been evaluated along with the patient's involvement and use of modern and state-of-the-art technologies.

The overall findings indicate that telemedicine has improved the patient's ability to actively participate in their health management, with more compliance toward the management of the medical problem and fewer OPD visits.

On the other hand, it encourages fewer doctor and paramedical staff requirements for a particular population size and the limited role of physical examination of the patient.

Keywords: Telemedicine; Artificial Intelligence; Patient care; Telehealth

1. Introduction

Since the COVID-19 pandemic telemedicine, modern technology and wearable devices have enhanced patient's access to different medical settings across the globe. (1)

The geographical and demographic challenging areas of the world have been covered with health care with the use of telemedicine and have enhanced patient's interaction with modern technology. (2)

The use of telemedicine has overall improved the quality of life and medical treatment, with more compliance of the patient with the treatment plan and reduced OPD visits (3)

It is essential that the role of telemedicine in the healthcare system be evaluated based on patient satisfaction, cost-effectiveness, ease of implementation, and patient outcomes. The use of smartphones and advanced technology for communication has revolutionized the healthcare system. Telemedicine plays a role in the management of patients as per evidence-based medicine with latest digital technology for a better outcome. (4)

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The use of telemedicine in the healthcare system has improved the level of care in remote rural areas with diverse demographics and is cost-effective. Telemedicine in patient care has some limitations like getting patients investigated, no doctor-patient contact and delivery of medicines. (4)

This review is to evaluate and analyze the effectiveness and limitations of telemedicine in the present healthcare system.

2. Patient's outcome and the advancement

Accessible evidence-based medical services are increasing regardless of the geographic or lingual limitations. The use of telemedicine and telehealth is bringing the patient, doctor, and medical services closer. The follow-up care is better as the travel time for the patient of the health care provider is reduced. (5)

The additional use of artificial intelligence and modern technology has improved diagnostic accuracy with patient-centred management and treatment. The use of smartwatches and wearable devices has improved the patient and provider relationship. The use of modern innovative technology helps with data collection and analysis; this further enhances better patient management. The patterns of chronic health problems are being addressed, as the primary care provider can be in regular contact with the patient and the family. This helps in more resource allocations to the medical care provider along with improved and targeted interventions.

3. Access to care and patient satisfaction

Remote and underserved areas can be accessed with state-of-the-art technology as then the geographical barriers have no limitations. The areas and population which earlier had no or limited access to the healthcare services can now be well managed. This keeps the patient, their families engaged as they now can play an active role in the treatment plan. The data analytics provides the healthcare provider and the research team, with insights and valuable information so the treatment protocols can be refined for better patient care. As the technology is advancing artificial intelligence and machine learning will make the workflow easy, streamlined, and more patient-friendly.

3.1. Telemedicine vs personal visits: Comparing patient outcomes.

As telemedicine technology improves and gains recognition in the field of patient care, their role as compared with personal visits needs to be compared and evaluated. The specialist's access to the patients in rural and underserved areas is limited but with the help of modern technology, the patients can get the best possible health care and advice. (6)

Studies have shown that telemedicine improves adherence of the patient to the management plan. (7)

The management of chronic medical conditions, such as diabetes has a better outcome when remote monitoring and telemedicine are used.

On the other hand, outpatient department visits increase the patient-doctor bond with face-to-face in-clinic consultations. Percussion, palpation and auscultation are also integral parts of the patient's examination which are lacking in teleconsultations. The information gathered by the physician in the clinic visit is more extensive but more comparative studies are required to evaluate this. (8)

Further research and policy reforms are required to integrate this innovative approach into the health care system.

3.2. Telemedicine and chronic medical conditions

As more healthcare providers are relying on digital platforms for the management of chronic medical conditions, the question of data privacy and security needs to be addressed. Furthermore, studies show that telemedicine has shown significant improvements in patient access, health outcomes, and satisfaction. (9)

The use of telemedicine and machine learning has impoverished the care of patients with chronic medical conditions, as now a regular follow-up with planned management is possible. The limitation in technology literacy of the patients can have unequal participation and addressing this issue will ensure long-term benefits from this new and ever-evolving healthcare delivery system. (10)

4. Experience with Telemedicine and Health Outcomes

As more patients are engaged in telemedicine, understanding the patient's perspective will help in further improving and shaping the outcomes of teleconsultations. As per the research in telemedicine, the patient lacks personal touch and personal interaction with the healthcare provider. Many patients ask for individual visits to the health care provider as it improves overall experience and satisfaction. The ease of telemedicine depends on the technology used, the patient's literacy levels, and the comfort level with the digital platform, due to this variability the teleconsultation needs to be tailored to the requirements of the patient and the circumstances. The feedback of the technology and the patient's outcome are required for a better outcome of the research work and the patients.

4.1. Telemedicine and geographical limitations

The use of telemedicine in remote, rural areas is increasing and it opens new doors to the growing partnerships between technology and healthcare. This partnership can create user-friendly platforms for telemedicine in rural and remote areas. The role of community health is important in rural and remote areas as the people in remote areas are less familiar with digital platforms. (11)

Local organizations can help educating rural populations on the importance and use of telemedicine for better health.

New and different telemedicine policies are required to be formulated for rural and remote areas with the help of local communities and data analysis. Formulating different policies and telemedicine platforms needs to be tailored to the requirements of the communities depending on their geographical location, social religious beliefs, and practices. (12)

Modern technology has bridged the gap in healthcare delivery but polices and technology need to be tailored to the needs of local and indigenous populations.

4.2. Telemedicine and post-operative care

Post-operative care can be managed to a certain extent by telemedicine and telehealth, it can improve patient-doctor relationships. Limitation comes from catheter care, care of surgical sites, drainage sites, and other post-surgical procedures that require direct doctor's care. (13)

These telehealth platforms help surgeons interact with the operated patient and family to ensure all post-surgical protocols are adhered to. Post-surgical complications are common and direct consultation of the surgeon with the operated patient can improve the outcome of the complications. This can reduce unnecessary hospital visits and associated costs and loss of human resources. (14)

Remote monitoring devices can help in patient recovery and better outcomes, using the platform the surgeon can be proactive to relate to any post-operative complications. Patients and healthcare providers can maximize their interaction on digital platforms by smooth and efficient incorporation of the technology in the healthcare system.

4.3. The Role of technology in enhancing telemedicine and patient outcomes

Diagnostic and investigative capabilities are enhanced by using artificial intelligence and machine learning. Artificial intelligence can analyze data from patient data banks and form independent sources to create a personalized recommendation for the management of the patient. Using this technology at best requires the training of both the medical care provider and the patient. (14)

Educating the population of remote and rural areas remains the crucial benchmark for the ideal use of telemedicine technology. Creating an environment where technology complements traditional care and tailored needs is essential for the efficient use of modern technology.

4.4. Challenges and limitations of telemedicine

Socioeconomic factors, geographical challenges, and access to modern technology influence to a great extent the effectiveness of telemedicine for patient care. In remote and rural areas there is a lack of electricity, fast internet for effective use of video calls, and less advanced digital devices. (15)

As different demographic areas have different health literacy, even the availability of modern technology would limit the use of telemedicine effectively. Targeted education in their local language given by their community members can increase the effectiveness of modern technology. (16)

To summarize digital literacy and community engagement in telehealth is the only way to bridge the gap between rural areas and telemedicine for effective healthy outcomes.

5. Discussion

Telemedicine and telehealth are ever-expanding and reaching out to the communities of the world. A regulatory framework is required for patient safety and for the quality of care provided by the digital platform. The privacy of the data needs to be maintained, which would be difficult on a digital platform. The remote population can be reached with technology but patient and healthcare provider one-to-one interaction with proper physical examination is limited which is required for a better outcome for the patient (17)

As the use of telemedicine grows the use of human manpower may reduce in the form of fewer job opportunities for healthcare professionals and on the contrary, it would create more job opportunities for software and hardware professionals. (18)

Taking into view, the job opportunities for healthcare professionals with the rise of telemedicine, departments like radiology, pathology, dermatology etc where one-to-one patient-doctor involvement is not required may see a decline. All these effects of telemediation need to be evaluated as the demand for telemedicine grows. (19)

On one hand, telemedicine may be beneficial to the patients and the community, but it may reduce the job opportunities for health professionals and in turn the supply of healthcare professionals may reduce due to fewer job opportunities. This may be a matter of concern but needs to be further studied and evaluated. (20)

As a study suggests intentional steps are needed to be taken to make sure that the deployment of artificial intelligence in healthcare has a positive impact on the doctor-patient relationship (21)

Artificial intelligence has the potential to alter the way human feeling, emotions, empathy, compassion, and trust are to be practiced in healthcare, it also suggests how these values can be incorporated into a system using artificial intelligence. On the other hand, society needs to reexamine the kind of health care it promotes and expects. (22)

5.1. Future trends

As telemedicine is evolving, the integration of mental health into this digital platform is needed. Most of the mental health management is by counselling of the patient and psychotherapy which can be done on the digital platform. (23)

Studies show that patients using digital platforms for consultation are more likely to be satisfied and have better outcomes as the consultation can be done as per the patient's choice and from the comfort of the patient's home. This digital platform greatly helped in the COVID–19 pandemic where the resources were limited. More effective digital technology is needed to make it available to most of the population, which would be easy to use and interact with (24).

6. Conclusion

Telemedicine is an upcoming digital environment that has broken the geographical barriers to reach the most medically underserved areas of the world. It requires and enforces patient participation for better medical outcomes, thus optimizing the best medical management. Chronic medical diseases have better results as there is regular patient involvement. The success of telemedicine depends on the implementation of the existing plans, management of the existing issues, and making the platform more patient-friendly. More data analysis and interaction of software professionals with health care providers is required for the upgradation of the digital platforms. By embracing modern technology, addressing associated challenges, incorporating patient feedback and surveys, telemedicine can be the future of patient care worldwide.

On the other hand, modern technology creates fewer job opportunities for medical professionals and paramedics. Fewer job opportunities for medical specialities cater to less or minimum doctor-patient interaction, this in turn will increase the work burden on a smaller number of healthcare professionals employed. A proper balance between the use of telemedicine and the employment of healthcare professionals may be a future demand as technology grows.

Compliance with ethical standards

Disclosure of conflict of interest

All authors have no conflict of interest.

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